

WHAT IS CLAIMED IS:

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1. An active matrix type display device comprising:  
a substrate having an insulating surface;  
a plurality of pixel electrodes arranged in a matrix form over said  
5 substrate;  
a plurality of switching elements operationally connected to said pixel  
electrodes, each of said switching elements comprising a thin film transistor;  
a display medium capable of electrically changing luminous strength  
disposed at each of said pixel electrodes; and  
10 a driver circuit comprising a plurality of thin film transistors for  
driving said plurality of switching elements,  
wherein each of said plurality of thin film transistors comprises a  
crystalline semiconductor layer, a gate insulating film adjacent to said crystalline  
semiconductor layer and a gate electrode adjacent to said gate insulating film.
- 15 2. The active matrix type display device according to claim 1 wherein  
said gate electrode is located over said semiconductor layer.
3. The active matrix type display device according to claim 1 wherein  
all of said plurality of thin film transistors are p-type.
- 20 4. The active matrix type display device according to claim 1 wherein  
all of said plurality of thin film transistors are n-type.
5. The active matrix type display device according to claim 1 wherein  
said substrate is a glass substrate.
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6. The active matrix display device according to claim 1 wherein said  
crystalline semiconductor layer comprises silicon.

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7. An active matrix type display device comprising:  
a substrate having an insulating surface;  
a plurality of pixel electrodes arranged in a matrix form over said  
substrate;  
5 a plurality of switching elements operationally connected to said pixel  
electrodes, each of said switching elements comprising a thin film transistor;  
a display medium capable of electrically changing luminous strength  
disposed at each of said pixel electrodes; and  
a driver circuit comprising a plurality of thin film transistors for  
10 driving said plurality of switching elements, wherein each of said plurality of thin  
film transistors comprises a crystalline semiconductor layer, a gate insulating film  
adjacent to said crystalline semiconductor layer and a gate electrode adjacent to said  
gate insulating film,  
15 wherein said crystalline semiconductor layer has source and drain  
regions and at least one lightly doped region.

8. The active matrix type display device according to claim 7 wherein  
said substrate is a glass substrate.

9. The active matrix type display device according to claim 7 wherein  
said source and drain regions and said at least one lightly doped region are doped  
20 with phosphorus.

10. The active matrix type display device according to claim 7 wherein  
said source and drain regions and said at least one lightly doped region are doped  
with boron.

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11. The active matrix type display device according to claim 7 wherein  
said gate electrode is located over said semiconductor layer.

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12. The active matrix display device according to claim 7 wherein said crystalline semiconductor layer comprises silicon.

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13. An active matrix type display device comprising:  
a substrate having an insulating surface;  
a plurality of pixel electrodes arranged in a matrix form over said substrate;

a plurality of switching elements operationally connected to said pixel electrodes, each of said switching elements comprising a thin film transistor;

a display medium capable of electrically changing luminous strength disposed at each of said pixel electrodes; and

a CMOS circuit comprising at least one n-channel type thin film transistor and one p-channel type thin film transistor,

wherein each of said n-channel and p-channel type thin film transistors comprises a crystalline semiconductor layer, a gate insulating film adjacent to said crystalline semiconductor layer and a gate electrode adjacent to said gate insulating film.

14. The active matrix type display device according to claim 13 wherein said substrate is a glass substrate.

15. The active matrix type display device according to claim 13 wherein said gate electrode is located over said semiconductor layer.

16. The active matrix display device according to claim 13 wherein said crystalline semiconductor layer comprises silicon.

17. An active matrix type display device comprising:  
a substrate having an insulating surface;

a plurality of pixel electrodes arranged in a matrix form over said substrate;

a plurality of switching elements operationally connected to said pixel electrodes, each of said switching elements comprising a thin film transistor;

5 a display medium capable of electrically changing luminous strength disposed at each of said pixel electrodes; and

a CMOS circuit comprising at least one n-channel type thin film transistor and one p-channel type thin film transistor, each of said thin film transistors comprising a crystalline semiconductor layer, a gate insulating film adjacent to said crystalline semiconductor layer and a gate electrode adjacent to said gate insulating film,

wherein said crystalline semiconductor layer has source and drain regions and at least one lightly doped region.

18. The active matrix type display device according to claim 17 wherein said substrate is a glass substrate.

19. An active matrix type display device comprising:  
a substrate having an insulating surface;  
a plurality of pixel electrodes arranged in a matrix form over said substrate;

20 a plurality of switching elements operationally connected to said pixel electrodes, each of said switching elements comprising a thin film transistor;  
a display medium capable of electrically changing luminous strength disposed at each of said pixel electrodes; and

25 a driver circuit comprising a plurality of thin film transistors for driving said plurality of switching elements,

wherein each of the film transistors of said switching elements and said driver circuit comprises a crystalline semiconductor layer, a gate insulating film

adjacent to said crystalline semiconductor layer and a gate electrode adjacent to said gate insulating film.

20. The active matrix type display device according to claim 19 wherein said gate electrode is located over said semiconductor layer.

5 21. The active matrix type display device according to claim 19 wherein all of said plurality of thin film transistors are p-type.

22. The active matrix type display device according to claim 19 wherein all of said plurality of thin film transistors are n-type.

10 23. The active matrix type display device according to claim 19 wherein said substrate is a glass substrate.

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24. The active matrix display device according to claim 19 wherein said crystalline semiconductor layer comprises silicon.

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15 25. An active matrix type display device comprising:  
a substrate having an insulating surface;  
a plurality of pixel electrodes arranged in a matrix form over said substrate;

a plurality of switching elements operationally connected to said pixel electrodes, each of said switching elements comprising a thin film transistor;

20 a display medium capable of electrically changing luminous strength disposed at each of said pixel electrodes; and

a driver circuit comprising a plurality of thin film transistors for driving said plurality of switching elements,

wherein each of the thin film transistors of the switching elements and the driver circuit comprises a crystalline semiconductor layer, a gate insulating

film adjacent to said crystalline semiconductor layer and a gate electrode adjacent to said gate insulating film,

wherein said crystalline semiconductor layer has source and drain regions and at least one lightly doped region.

5           26.    The active matrix type display device according to claim 25 wherein said substrate is a glass substrate.

27.    The active matrix type display device according to claim 25 wherein said source and drain regions and said at least one lightly doped region are doped with phosphorus.

10           28.    The active matrix type display device according to claim 25 wherein said source and drain regions and said at least one lightly doped region are doped with boron.

29.    The active matrix type display device according to claim 25 wherein said gate electrode is located over said semiconductor layer.

30.    The active matrix display device according to claim 25 wherein said crystalline semiconductor layer comprises silicon.

31.    An active matrix type display device comprising:  
a substrate having an insulating surface;  
a plurality of pixel electrodes arranged in a matrix form over said  
20    substrate;  
a plurality of switching elements operationally connected to said pixel electrodes, each of said switching elements comprising a thin film transistor;  
a display medium capable of electrically changing luminous strength disposed at each of said pixel electrodes; and

a CMOS circuit comprising at least one n-channel type thin film transistor and one p-channel type thin film transistor,

5 wherein each of the film transistors of the switching elements and said n-channel and p-channel type thin film transistors comprises a crystalline semiconductor layer, a gate insulating film adjacent to said crystalline semiconductor layer and a gate electrode adjacent to said gate insulating film.

32. The active matrix type display device according to claim 31 wherein said substrate is a glass substrate.

10 33. The active matrix type display device according to claim 31 wherein said gate electrode is located over said semiconductor layer.

34. The active matrix display device according to claim 31 wherein said crystalline semiconductor layer comprises silicon.

15 35. An active matrix type display device comprising:  
a substrate having an insulating surface;  
a plurality of pixel electrodes arranged in a matrix form over said substrate;

a plurality of switching elements operationally connected to said pixel electrodes, each of said switching elements comprising a thin film transistor;

20 a display medium capable of electrically changing luminous strength disposed at each of said pixel electrodes; and

a CMOS circuit comprising at least one n-channel type thin film transistor and one p-channel type thin film transistor,

25 wherein each of the film transistors of the switching elements and said n-channel and p-channel type thin film transistors comprises a crystalline semiconductor layer, a gate insulating film adjacent to said crystalline semiconductor layer and a gate electrode adjacent to said gate insulating film, and said crystalline

semiconductor layer has source and drain regions and at least one lightly doped region.

36. The active matrix type display device according to claim 35 wherein said substrate is a glass substrate.

37. The active matrix display device according to claim 35 wherein said crystalline semiconductor layer comprises silicon.

38. The active matrix display device according to claim 17 wherein said crystalline semiconductor layer comprises silicon.

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